REMARKS

The application has been amended and is believed to be in condition for allowance.

Claim 2 has been amended responsive to the claim objection.

Claims 9-10 have been amended to overcome the section 101 rejection by reciting a computer readable medium tangibly embodying a computer program comprising elements of program code executable by the computer to control the computer, in the manner specified by claims 1 and 6.

Withdrawal of the claim 2 objection and section 101 rejection is solicited.

Claims 1-18 were rejected as anticipated by HILDEBRAND 5,615,171.

Applicants respectfully disagree.

With regards to claim 1, HILDEBRAND discloses claimed steps a) and b), i.e., a). using as optimum offset of two adjacent continuous local seismic traces $S_{ij,k}(t)$ and $S_{pq,k}(t)$, the value of offset rendering maximum their correlation function, this optimum offset not necessarily being a whole number multiple of the vertical sampling interval; and b). using as conditional neighborhood of a central continuous local seismic trace $S_{ij,k}(t)$ the sub-neighborhood consisting of adjacent traces $S_{pq,k}(t)$ corresponding to optimum offsets associated with correlations

$R_{ij,pq,k}(h)$ greater than a predetermined threshold comprised between 0 and 1.

However, HILDEBRAND does not disclose claimed steps c), d), and e).

Applicants find that HILDEBRAND does not disclose any of c). selecting a property of a subsurface to be smoothed in the conditional neighborhood of a point (i, j, k) of a reference "central" continuous local seismic trace; d). offsetting the subsurface properties of the conditional neighborhood by translating the current variable of the value of optimum offset $h_{ij,pq,k}$; and e). taking as the smoothed value of the point (i, j, k) an average of the subsurface properties offset in step d).

The Official Action offered HILDEBRAND column 6, line 31- column 11, line 45 for seteps c), d), and e).

This portion of HILDEBRAND concerns Batch Phase and first addresses creation of candidate bit volume. Figure 5 does illustrate transformation of seismic wavelet amplitudes as a function of depth. The Pick program 110 is applied to each maximum amplitude of each wavelet of each center trace of each seismic three-by-three bit volume.

Figures 6A and 6B identify maximum wavelet amplitudes for each depth of a center trace of a three-by-three "volume" of traces. Next, a five-trace test set of wavelets to the "south", "west", "north" and "east" (labeled A, B, C, D).

The disclosed pick method steps through the multiple trace verification process in a five trace set by picking four adjacent (side) traces (see Figure 6B) and verifying each of the four points A,B,C and D. This process is repeated for each wavelet. See TABLE I. Like in TABLE I, the corresponding depths of side traces A,B,C,D are also stored as illustrated in TABLE II.

At column 7, beginning with line 58, there is a discussion on determination of final bit volume to faithfully reproduce the horizons as determined from the seismic data. The bits at the various depths z' for the x=2, y=1 3X3 volume of data must be validated to insure that the "1" bits set at the z' depths lie on a horizon as determined from the picking method for the x=1, y=1 3x3 volume of data. See TABLE III. TABLE IV reflectsthe bits at the various depths z for the x=1, y=1 3x3 volume of data, validated to insure that there is one horizon common between the bits set in z for x=1, y=1 and in z' for x=2, y=1.

At column 9, beginning with line 25, there is an alternative method and apparatus for creation of compressed trace volume. The alternative approach recognizes that there are 80 to 90 percent zeros in a final bit volume. Accordingly, the alternative replaces all "1" bits of the final bit volume with an indexed file that contains interpolated precise time or depth location of its seismic trace, all "0"s are discarded.

The resulting horizon information volume, in this case a final bit volume transformed into a compressed trace volume, includes about 50 percent more total bits (because of the storing of depth information in it) than the final bit volume, but it still is about 5 times smaller than the original 3-D seismic volume.

Fiugre 9 illustrates the interactive phase after the batch phase has been completed, showing a 2D seismic section. A seed point is selected by the user, for example, by placing the mouse cursor at point P and clicking the mouse. The mouse click creates x, y and depth (z) information which corresponds to a particular 1 bit of the final bit volume 102 stored in RAM memory of computer 100.

Table V describes the operation of the scanner, the scanner placing the initial seed point and other selected x, y, z points which become seed points through processing in a "QUEUE". Each seed point of the "QUEUE" is tested in turn. Through the scanning process, the x-y coordinates of the horizon map 110 are assigned with z values or "depths" which are on the same bedding plane or "horizon" as the seed point. When the scanning process stops, depth points have been added to the horizon map through which there exists a path from the original seed point to any point determined from it.

Thus, HILDEBRAND teaches forming a 2d horizon map and then adding depth points to the horizon map, the depth points being developed with respect to a seed point.

However, HILDEBRAND does not disclose any of c). selecting a property of a subsurface to be smoothed in the conditional neighborhood of a point (i, j, k) of a reference "central" continuous local seismic trace; d). offsetting the subsurface properties of the conditional neighborhood by translating the current variable of the value of optimum offset $h_{ij,pq,k}$; and e). taking as the smoothed value of the point (i, j, k) an average of the subsurface properties offset in step d).

Thus, there is no anticipation.

Reconsideration and allowance of all the claims are respectfully requested.

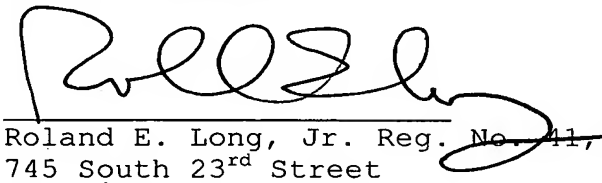
Should there be any matters that need to be resolved in the present application; the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any

overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON



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